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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.

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EXAMINER
NGUYEN, S

ART UNIT	PAPER NUMBER
	#28

DATE MAILED: 01/14/99

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
08/892,836	Skeem et al.
Examiner	**Group Art Unit**
Nguyen	3723

☒ Responsive to communication(s) filed on *Dec 3, 1998*.

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-34* is/are pending in the application.

Of the above, claim(s) *2 and 27* is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1, 3-26, and 28-34* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- *SEE OFFICE ACTION ON THE FOLLOWING PAGES* ---

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-26, and 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asada'276 in view of Scott'072 and Lowder et al.'673.

With reference to Figures 7-9, Asada discloses an abrasive cutting tool comprising: a) a monolithic substrate (5) having a substrate surface with plurality of teeth (7) extending therefrom, each tooth having a contoured surface; b) a layer comprising superabrasive grains (8) such as diamond, the layer being electroplated to at least a portion of the surface of each tooth to define a plurality of cutting levels parallel to the substrate surface, and each cutting level on each tooth being oriented such that a portion of each cutting level overlaps at least a portion of each other cutting level of the tooth; and c) an initial uppermost cutting level and successive uppermost cutting levels among the plurality of cutting levels of each tooth, whereby after the initial uppermost cutting level has been worn away by cutting the workpiece, each successive uppermost cutting level of the tooth presents to the workpiece a ring of superabrasive grain around the contoured surface of the tooth, and substantially all superabrasive grain within the ring

simultaneously engages in cutting. But Asada does not disclose the cutting surface having a negative angle of inclination with respect to the intended direction of movement and the abrasive layer being chemically bonded to at least a portion of the surface of each tooth.

With reference to Figs. 2-4, column 4, line 50 bridging to column 5, line 50, Scott discloses that the mesh cutting element 34 defines a surface inclined relative to the travel direction 50 of the cutting tool. The cutting element 34 is a mesh comprising abrasive material formed by uniformly distributing and securing hard, wear resistance particles, such as industrial diamonds. The cutting mesh is bonded to the support links by an adhesive agent such as industrial epoxy or by brazing. The bonding agent may also include a layer or wearable or consumable material to provide additional support for the cutting mesh on the support links. With reference to Fig. 8, column 7, line 33 bridging to column 8, line 12, the inclination of the planar surface of the mesh, whether it is on the support or the cover, applies only a relatively small area of the trailing edge of the mesh cutting element to the material cut. This reduces the area of contact between the material to be cut and the cutting element, and thereby reduces the force required to accomplish the cutting action. As the mesh cutting element 34 wears at its trailing edge, some of the consumable material 48 following the cutting element 34 also wears away. However, it always leaves a next row of particles in abrading contact with the material to be cut. In essence, Scott discloses a cutting element having a cutting surface with a negative angle of inclination with respect to the intended direction of movement. Furthermore, Scott discloses in column 8, lines 16-18, this cutting element with its inclined cutting surface may be applied to a circular saw. But

Scott is silent about the brazing method to chemically bond the abrasive layer to the surface of the tooth.

With reference to Fig. 1, column 2, line 47 bridging to column 6, line 59, Lowder discloses an improved diamond abrasive tool and method of manufacture characterized by a direct brazing technique of diamond crystals to a substrate surface which requires no pre-conditioning of the surface of the diamond in order to obtain the necessary wetting thereof. The method employed utilizes readily available, very hard and durable brazing alloys which have been discovered to readily wet the diamond surface to obtain a final product wherein the minimum depth of the alloy bond tends to occur intermediate adjacent diamond crystals with outstanding retention of the crystals and greatly extended tool life. In column 5, lines 27-35, Lowder further discloses that the application of the described invention to the manufacture of diamond abrasive tools encompasses a great variety of sizes, shapes, and types of tools from extremely thin abrasive discs to larger diameter grinding wheels and saw blades.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the abrasive tool of Asada with a cutting element having a cutting surface with a negative angle of inclination with respect to the intended direction of movement as taught by Scott'072 to reduce the area of contact between the material to be cut and the cutting element, and thereby reduces the force required to accomplish the cutting action; and further modified with the brazing method of Lowder et al.'673, in order to wet the diamond

surface to chemically bond the diamond to the tooth substrate to provide a very strong securement of the diamond to the tooth.

In regard to claims 4-12, 15-26, and 31-32, it would have been obvious matter of design choice to select the grain concentration and hardness index for the tooth depending on the material to be cut. Such engineering specification is well within the skill of the artisan.

In regard to claims 33-34, it would have been obvious matter design choice to apply the cutting element to core drills or abrasive sheets depending on the intended use.

Response to Arguments

3. Applicant's arguments filed 12/3/98 have been fully considered but they are not persuasive.

In response to applicant's argument that the combination of Asada, Scott, and Lowder does not suggest the claimed invention, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, as described in the above rejection Scott discloses cutting element 34 wearing at its trailing edge, always leaving a next row of particles in abrading contact with the material to be cut. Essentially, so does the claimed invention.

In response the applicant's Second Declaration, the Examiner feels that although the test result may be true, but that does not necessarily render the claimed invention unobvious or overcome the combined prior art.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Nguyen whose telephone number is (703) 308-0163. The examiner can normally be reached on Monday-Friday from 7:00 AM-3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Scherbel, can be reached at (703) 308-1272. The fax number for this Group is (703) 305-3579.

An inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at (703) 308-1148.

George Nguyen

1/11/99

George Nguyen
Patent Examiner

ROBERT A. ROSE
PRIMARY EXAMINER
ART UNIT 323